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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/976,723	10/11/2001	Niels F. Jacksen	021953.0291 (ET 00-07)	2502

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EXAMINER	
WILSON, SCOTT R	

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/976,723	JACKSEN ET AL.	
	Examiner	Art Unit	
	Scott R. Wilson	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *29 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *1-14* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-25 and 27-31* is/are rejected.

7)☒ Claim(s) *26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of claims 15-31 in Paper No. 4 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 15-19, 21-23, 27 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by White. As to claim 15, White, Figure 2, discloses a two-dimensional array of mercury cadmium telluride detector elements monolithically formed on an integrated circuit. White further discloses that mercury cadmium telluride may be replaced with either lead tin telluride or lead selenide telluride (col. 1, lines 62-64), both of which are lead salts. The array of White comprises an integrated circuit comprising a passivation layer (14, Figure 1a), and a plurality of electrical contacts (134a, 134b, 134c), the passivation layer having vias to the electrical contacts, a delineated, sensitized mercury cadmium telluride layer (120, Figure 1c) formed upon the passivation layer, the delineations forming a plurality of detector elements (132, Figure 1e), and electrical couplers (138a), (238b), (338c) formed between the electrical contacts and the detector elements.

As to claim 16, White discloses the passivation layer to comprise silicon dioxide (col. 3, line 49).

As to claim 17, White discloses a preferred material for the electrical contacts (134a, 134b, 134c) to be gold (col. 5, line 21).

As to claim 18, White discloses the thickness of the mercury cadmium telluride body (120) to be about 10 to 12 microns (Figure 1c, and col. 4, line 34), which would make the pitch between neighboring detector elements illustrated beginning in Figure 1e within the scope of around 30 microns.

As to claim 19, White, Figure 2, discloses a conductive material formed upon the passivation layer and underlying the mercury cadmium telluride layer, in which the conductive material is formed into a plurality of detector element contacts (16a, 16b, 16c) and a common grid for the detector elements, wherein the electrical couplers (138a, 238b, 338c) between the electrical contacts (134a, 134b, 134c) and the detector elements (132, 232, 332) comprise electrical couplers between the electrical contacts and the detector element contacts.

As to claim 21, White, Figure 2, discloses that the electrical couplers (138a, 238b, 338c) overlay at least part of the detector element contacts (16a, 16b, 16c).

As to claim 22, White, Figure 2, discloses that the electrical couplers (138a, 238b, 338c) overlay at least part of the detector element contacts (16a, 16b, 16c) and the detector elements (132, 232, 332).

As to claim 23, White, Figure 2, discloses that the electrical couplers (138a, 238b, 338c) overlay at least part of the detector elements (132, 232, 332).

As to claim 27, White, Figure 1e, discloses a passivation layer (130) formed over the mercury cadmium telluride layer (120), which may also be embodied as a lead-salt layer.

As to claim 31, White, Figure 2, discloses a two-dimensional array of mercury cadmium telluride detector elements monolithically formed on an integrated circuit. White further discloses that mercury cadmium telluride may be replaced with either lead tin telluride or lead selenide telluride (col. 1, lines 62-64), both of which are lead salts. The array of White comprises an integrated circuit comprising a passivation layer (14, Figure 1a), and a plurality of electrical contacts (134a, 134b, 134c), the passivation layer having vias to the electrical contacts, a delineated, sensitized mercury cadmium telluride layer (120, Figure 1c) formed upon the passivation layer, the delineations forming a plurality of detector elements (132, Figure 1e), and electrical couplers (138a), (238b), (338c) formed between the electrical contacts and the detector elements. Although not expressly stated, it would be inherent that an infrared sensor could have associated optics, in the sense of an optical system which could refract light at infrared wavelengths in order to bring it to a focus on the sensor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Paine et al.. White, Figure 2, discloses the invention of claim 19, as described above. White does not disclose expressly the conductive material of the detector element contacts comprising titanium-gold. Paine et al., column 2, line 66, discloses an infrared detector device with titanium-gold contact pads. At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the conductive material of the detector element contacts from titanium-gold. The motivation for doing so would have been to make the contacts deformable (Paine et al., col. 2, line 64). Therefore, it would have been obvious to combine Paine et al. with White to obtain the invention as specified in claim 20.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Nathanson et al.. White, Figure 2, discloses the invention of claim 15, as described above. White does not disclose the lead-salt embodied as lead selenide. Nathanson et al., column 1, line 14, discloses prior art infrared sensors utilizing lead selenide. At the time of invention, it would have been obvious to a person of ordinary skill in the art to embody the lead-salt of claim 15 as lead selenide. The motivation for doing so would have been to use a possibly more economical material in the 3 to 12 micron wavelength region. Therefore, it would have been obvious to combine Nathanson et al. with White to obtain the invention as specified in claim 24.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Martin et al.. White, Figure 2, discloses the invention of claim 15, as described above. White does not disclose a textured passivation layer. Martin et al., column 8, line 4, discloses a metal semiconductor metal photodiode in which the passivation coating is textured. At the time of invention, it would have been obvious to a person of ordinary skill in the art to texture the passivation coating. The motivation for doing

so would have been to increase the electrical response and add mechanical strength (Martin et al., col. 8, lines 6-10). Therefore, it would have been obvious to combine Martin et al. with White to obtain the invention as specified in claim 25.

Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Nathanson et al.. As to claim 28, White, Figure 2, discloses a two-dimensional array of mercury cadmium telluride detector elements monolithically formed on an integrated circuit. White further discloses that mercury cadmium telluride may be replaced with either lead tin telluride or lead selenide telluride (col. 1, lines 62-64), both of which are lead salts. The array of White comprises an integrated circuit comprising a passivation layer (14, Figure 1a), and a plurality of electrical contacts (134a, 134b, 134c), the passivation layer having vias to the electrical contacts, a delineated, sensitized mercury cadmium telluride layer (120, Figure 1c) formed upon the passivation layer, the delineations forming a plurality of detector elements (132, Figure 1e), and electrical couplers (138a), (238b), (338c) formed between the electrical contacts and the detector elements. White further discloses the thickness of the mercury cadmium telluride body (120) to be about 10 to 12 microns (Figure 1c, and col. 4, line 34), which would make the pitch between neighboring detector elements illustrated beginning in Figure 1e within the scope of around 30 microns. White, Figure 2, also discloses a conductive material formed upon the passivation layer and underlying the mercury cadmium telluride layer, in which the conductive material is formed into a plurality of detector element contacts (16a, 16b, 16c) and a common grid for the detector elements, wherein the electrical couplers (138a, 238b, 338c) between the electrical contacts (134a, 134b, 134c) and the detector elements (132, 232, 332) comprise electrical couplers between the electrical contacts and the detector element contacts. White does not disclose the lead-salt embodied as lead sulfide. Nathanson et al., column 1, line 14, discloses prior art infrared sensors utilizing lead sulfide. At the time of invention, it would have been obvious to a person of ordinary skill in the art to embody the lead-salt of White as lead sulfide. The motivation for doing so would have been to use a possibly more economical material in the 3 to 12 micron wavelength region. Therefore, it would have been obvious to combine Nathanson et al. with White to obtain the invention as specified in claim 28.

As to claim 29, White, Figure 2, discloses that the electrical couplers (138a, 238b, 338c) overlay at least part of the detector element contacts (16a, 16b, 16c) and the detector elements (132, 232, 332).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over White in view of Nathanson et al. and further in view of Martin et al.. White, Figure 2, discloses a two-dimensional array of mercury cadmium telluride detector elements monolithically formed on an integrated circuit. White further discloses that mercury cadmium telluride may be replaced with either lead tin telluride or lead selenide telluride (col. 1, lines 62-64), both of which are lead salts. The array of White comprises an integrated circuit comprising a passivation layer (14, Figure 1a), and a plurality of electrical contacts (134a, 134b, 134c), the passivation layer having vias to the electrical contacts, a delineated, sensitized mercury cadmium telluride layer (120, Figure 1c) formed upon the passivation layer, the delineations forming a plurality of detector elements (132, Figure 1e), and electrical couplers (138a), (238b), (338c) formed between the electrical contacts and the detector elements. White further discloses the thickness of the mercury cadmium telluride body (120) to be about 10 to 12 microns (Figure 1c, and col. 4, line 34), which would make the pitch between neighboring detector elements illustrated beginning in Figure 1e within the scope of around 30 microns. White, Figure 2, also discloses a conductive material formed upon the passivation layer and underlying the mercury cadmium telluride layer, in which the conductive material is formed into a plurality of detector element contacts (16a, 16b, 16c) and a common grid for the detector elements, wherein the electrical couplers (138a, 238b, 338c) between the electrical contacts (134a, 134b, 134c) and the detector elements (132, 232, 332) comprise electrical couplers between the electrical contacts and the detector element contacts. White does not disclose the lead-salt embodied as lead selenide. Nathanson et al., column 1, line 14, discloses prior art infrared sensors utilizing lead selenide. Neither does White disclose a textured passivation layer. Martin et al., column 8, line 4, discloses a metal semiconductor metal photodiode in which the passivation coating is textured. At the time of invention, it would have been obvious to a person of ordinary skill in the art to embody the lead-salt of White as lead selenide as well as to texture the passivation coating. The motivation for doing so would have been to use a possibly more economical material in the 3 to 12 micron wavelength region and to increase the electrical response and add mechanical strength (Martin et al., col. 8, lines 6-10).

Therefore, it would have been obvious to combine Nathanson et al. and Martin et al. with White to obtain the invention as specified in claim 30.

Allowable Subject Matter

Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art textures an intermediate coating between the passivation layer and the lead-salt layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott R. Wilson whose telephone number is 703-308-6557. The examiner can normally be reached on M-F 8:30 - 4:30 Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 703-308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.

srw
July 17, 2003

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